

CLAIMS

What is claimed is:

1. A method for extracorporeal collection of blood components from a donor/patient, comprising:
 - 5 flowing blood into a blood processing vessel;
 - separating platelets from said blood within said blood processing vessel;
 - collecting at least a portion of said platelets in a platelet collection reservoir separate from said blood processing vessel;
 - separating red blood cells from said blood within said blood processing
 - 10 vessel;
 - collecting at least a portion of said separated red blood cells in a red blood cell collection reservoir separate from said blood processing vessel, wherein said platelet separation and collection steps are completed separate from said red blood cell separation and collection steps.
- 15 2. A method as recited in Claim 1, wherein said platelet separation and collection steps are completed prior to said red blood cell separation and collection steps.
3. A method as recited in Claim 1, wherein prior to said red blood cell separation and collection steps, and separate from said platelet separation and
- 20 collection steps, said method further comprises a red blood cell collection set-up phase including:
 - separating red blood cells from said blood within said blood processing vessel;

establishing an AC ratio in the blood processing vessel of between about 6 and 16 and a packing factor of at least about 11 within separated red blood cells within said blood processing vessel.

4. A method as recited in Claim 3, wherein said packing factor is established to be about 13, and wherein said AC ratio is established to be about 8.

5. A method as recited in Claim 3, said set-up phase further including: flowing blood components out of said blood processing vessel, wherein substantially all of said blood components flowing out of the blood processing vessel are accumulated for infusion to a donor/patient.

6. A method as recited in Claim 3, further comprising: removing said blood from a donor/patient through a single needle; returning uncollected components of said blood to said donor/patient through said single needle.

7. A method as recited in Claim 6, wherein said removing and returning steps are alternately and repeatedly performed during corresponding blood processing and blood component return modes, respectively.

8. A method as recited in Claim 6, wherein during said platelet separation and collection steps, said method further comprises:

recirculating a portion of said uncollected blood components into said blood processing vessel; and, wherein during said red blood cell separation and collection steps, said method includes:

returning substantially all of said uncollected blood components to said donor/patient.

9. A method as recited in Claim 3, wherein said blood is flowed into said blood processing vessel at a flow rate, and said establishing step comprises:

reducing said flow rate.

5 10. A method as recited in Claim 3, wherein said blood processing vessel is rotated at an rpm rate, and wherein said establishing step comprises:

increasing said rpm rate.

11. A method as recited in Claim 3, said establishing step including:
10 maintaining a predetermined anticoagulant infusion rate to said donor/patient.

12. A method as recited in Claim 3, said establishing step including:
removing platelets and plasma together through a common port from said blood processing vessel.

13. A method as recited in Claim 1, wherein during said platelet
15 separation and collection steps said method further comprises:
separating plasma from said blood within said blood processing vessel;
collecting at least a portion of said separated plasma in a plasma collection reservoir.

14. A method as recited in Claim 1, wherein during said red blood cell
20 separation and collection steps said method further comprises:
separating plasma from said blood within said blood processing vessel;
collecting at least a portion of said separated plasma in a plasma collection reservoir.

15. A method as recited in Claim 1, further comprising:

adding a storage solution to said red blood cells collected in said red blood cell collection reservoir.

16. A method as recited in Claim 15, wherein said storage solution is added through an assembly having a sterile barrier filter.

5 17. A method as recited in Claim 1, further comprising:
leukoreduction filtering of said red blood cells collected in said red blood cell collection reservoir.

18. A method for extracorporeal collection of blood components from a donor/patient comprising:

10 removing blood from a donor/patient through a single needle;
flowing said blood into a blood processing vessel;
separating platelets from said blood within said blood processing vessel;
collecting at least a portion of said platelets in a platelet collection reservoir separate from said blood processing vessel;

15 separating red blood cells from said blood within said blood processing vessel;

collecting at least a portion of said separated red blood cells in a red blood cell collection reservoir separate from said blood processing vessel, wherein said platelet separation and collection steps are completed separate from said red blood cell separation and collection steps;

20 returning uncollected blood components of said blood to said donor/patient through said single needle.

19. A method as recited in Claim 18, further comprising:
separating plasma from said blood within said blood processing vessel;

collecting at least a portion of said plasma in a plasma collection reservoir separate from said blood processing vessel, wherein said plasma separation and collection steps are completed at least partially contemporaneous with said platelet separation and collection steps.

5 20. A method as recited in Claim 18, wherein prior to said red blood cell separation and collection steps, and separate from said platelet separation and collection steps, said method further comprises a red blood cell collection set-up phase including:

10 separating red blood cells from said blood within said blood processing vessel;

 establishing a hematocrit of at least about 75% within said separated red blood cells within said blood processing vessel and an AC ratio within said blood at about 8.

 21. A method as recited in Claim 20, further comprising:

15 maintaining said hematocrit and AC ratio during said red blood cell separation and collection steps.